



Operating Instructions
Universal Sample Pump
Catalog No. 224-PCXR8

SKC Inc.
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Eighty Four, PA 15330

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Indicates a warning or caution.



Indicates a premier feature of the pump.

*Universal Sample Pump Operating Instructions
are also available in Spanish, German, and French Canadian.*

Notice: *This operating instruction may not address all safety concerns (if any) associated with this product and its use. The user is responsible for determining and following the appropriate safety and health practices and regulatory limitations (if any) before using the product. The information contained in this document should not be construed as legal advice, opinion, or as a final authority on legal or regulatory procedures.*

Description

The PCXR8 Universal Sample Pump is a constant flow air sampler suitable for a broad range of applications. It is ideal for industrial hygiene studies as well as environmental testing.



PCXR8 Universal Sample Pump

Performance Profile

Flow Range: 5 to 5000 ml/min (UL Listed model)
(5 to 500 ml/min requires adjustable low flow holder)

Weight: 33 oz (936 gm)

Dimensions: 1.9 x 4.7 x 5.1 inches, 45.6 cubic inches
(4.8 x 11.9 x 13 cm, 743 cubic cm)

Compensation Range: 1000 to 2500 ml/min at 40 inches water back pressure
3000 ml/min at 35 inches water back pressure
4000 ml/min at 20 inches water back pressure

Typical Back Pressure of Sampling Media (*inches water*)

Flow Rate (L/min)	1.0	1.5	2.0	2.5	3.0
Filter/Pore Size (µm)					
25-mm MCE, 0.8	6	9	12	15	18
25-mm MCE, 0.45	14	22	28	35	40
37-mm MCE, 0.8	2	3	4	5	6
37-mm PVC, 5.0	1	1	2	2	2.5

Compare the information in this table to pump compensation range to determine appropriate applications.

Flow Control: Holds constant flow to ±5% of the set point

Run Time: 8 hrs minimum at 4000 ml/min and 20 inches water back pressure
Dependent on media used. *See Table 1.*
Mains Adapter: 9999 minutes (6.8 days). Pump will shut off as run time cannot exceed timer range (*see Time Display on p. 3*).

Flow Indicator: Built-in rotameter with 250-ml division; scale marked at 1, 2, 3, 4, and 5 L/min

Power Supply: 6.0 V plug-in NiCad battery pack, rechargeable, 2.0 Ah capacity

Intrinsically Safe: UL Listed for: Class I, Groups A, B, C, D; Class II, Groups E, F, G; and Class III. Temp Code T3C.
MSHA approved models available. Contact SKC.

Temperature: **Operating:** ... -20 C to 45 C (-4 F to 113 F)

Storage: -40 C to 45 C (-40 F to 113 F)

Charging: 5 C to 45 C (41 F to 113 F)

! **Protect sample pump from weather when in use outdoors.**

Operating Humidity: 0 to 95% Relative

Multiple-tube Sampling:... Built-in constant pressure regulator allows user to take up to four simultaneous tube samples at different flow rates up to 500 ml/min using optional adjustable low flow holder.

RFI/EMI Shielding: Complies with requirements of EN 55022, FCC Part 15 Class B, EN 50082-1; frequency range of the radiated susceptibility test was 27 MHz to 1000 MHz.

Flow Fault:..... Fault shutdown with LCD indicator and time display retention if flow is restricted.

Battery Test:..... LCD shows battery condition prior to sampling.

Time Display: LCD shows sampler run time in minutes for sampling period elapsed time, pump run time, or total elapsed time including delayed start time. 1 to 9999 minutes (6.8 days). Pump will shut off at 9999 minutes. To reset, restart the pump.

Timing Accuracy: ±0.05% (±45 seconds per day)

Timed Shutdown: Allows user to select minutes of operation before automatic shutdown. Timed shutdown maximum is 9999 minutes (6.8 days).

Delay On: Allows user to select minutes to delay test up to 9999 minutes (6.8 days).

Intermittent Sampling: Programmable to allow user to extend short-term samples over an extended period of time to meet Time-Weighted Average (TWA) requirements with a reduced number of samples. Elapsed time maximum is 9999 minutes (6.8 days), at which time the sample pump shuts down.



CE marked



UL Listed

See UL Certificate on p. 30



ATEX-approved models available



MSHA-approved models available

Table 1. Pump Run Time in Hours with NiCad Battery

Following are typical run times achieved when using a fully charged Nickel-Cadmium (NiCad) battery pack. Data is sorted by type of sample media. All run times are listed in hours. Results obtained using a new pump and new fully charged battery. Pump performance may vary.

Mixed Cellulose (MCE) filter, 0.8 µm pore size

Flow Rate (L/min)	Filter Diameter	
	37 mm	25 mm
2.0	24.1	16.3
2.5	21.4	14.5
3.0	19.1	11.0
3.5	17.8	10.7
4.0	15.4	**
4.5	14.6	**

Polyvinyl Chloride (PVC) filter, 5.0 µm pore size

Flow Rate (L/min)	Filter Diameter	
	37 mm	25 mm
2.0	31.6	21.7
2.5	27.7	24.0
3.0	27.0	18.6
3.5	22.8	16.4
4.0	19.4	16.2
4.5	19.0	14.6

** Filter back pressure exceeded pump capability during testing

Note

Increases in back pressure during sampling due to buildup of sample on the filter can decrease battery life.

Operation

High Flow Applications (1000 to 5000 ml/min)

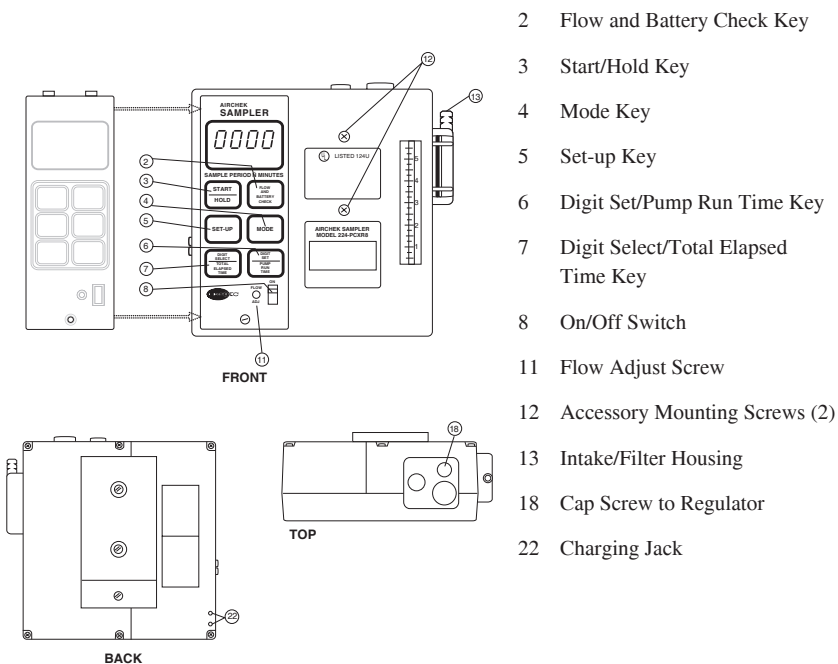


Figure 1

Front, back, and top views of PCXR8 Sampler
For additional drawings, see pp. 25 and 27.

Setup

Charge the battery by connecting the charger plug to the sampler charging jack (Figure 1, #22). Ensure that the battery is fully charged.

1



Do not charge in a hazardous environment.



Use only an SKC-approved charger designated for this model to ensure reliable performance and to maintain the SKC warranty.



Charger and battery pack connected

2

De-activating the Regulator

To ensure the pump is set for high flow, remove the cap screw (Figure 1, #18) covering the regulator valve and turn the exposed screw clockwise until it stops. (Do not overtighten.)

Replace the cap screw. The pump is now set for high flow.



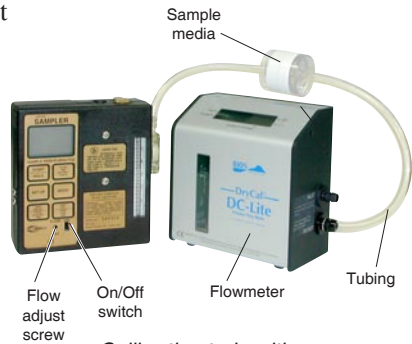
*For high flow,
turn valve screw
clockwise.*

3

Setting or Verifying Flow Rate

Using 1/4-inch Tygon® tubing, connect the sampling medium to the pump intake (Figure 1, #13).

Remove the tamper-resistant cover. Start the pump using the on/off switch (Figure 1, #8). Press Start/Hold (Figure 1, #3). Press Flow and Battery Check (Figure 1, #2). Adjust the flow using the flow adjust screw (Figure 1, #11) until the built-in rotameter reads 2 L/min. The LCD should indicate BATT OK in the upper left corner (if it doesn't, recharge the battery).



*Calibration train with
filter cassette*

Press Flow and Battery Check to place the pump in Hold.

Connect a flowmeter to the intake of the sampling medium.

Press Flow and Battery Check to start the pump, and set the flow rate using the flow adjust screw (Figure 1, #11).

When the flow rate is set, press Flow and Battery Check to place the pump in Hold. Disconnect the flowmeter.

Replace the sampling media used for calibration with unexposed media for sample collection.

4

Programming Delayed and Intermittent Sampling

To enter Delayed Start Mode:

From Hold, press Set-up. Enter the number of minutes delay (up to 9999) before the sampling period begins by pressing Digit Select and Digit Set. Digit Select advances the flashing digit and Digit Set increases the value of the flashing digit.

To enter Sample Period Mode:

Press Mode. Press Digit Select and Digit Set to enter the sampling time period in minutes (up to 9999). **Note:** The sample period is the total period in which sampling is performed and not the pump run time.

To enter Pump Period Mode:

Press Mode. This is the actual running time of the pump. Use Digit Select and Digit Set to enter the pump run time in minutes (up to 9999).

If intermittent sampling is not desired, set the sampling period to equal the pump period. If the pump running time is less than the sampling period, the pump will automatically calculate and control on/off cycling to complete the pump run time during the sampling period.

Pressing Mode will scroll through the program sequence.

! *For intermittent sampling, the elapsed time maximum is 9999 minutes (6.8 days), at which time the sample pump will shut down.*



PCXR8 Keypad

Sampling

For personal sampling, clip the sample collection media to the worker in the breathing zone.

! *Protect sample pump from weather when in use outdoors.*

While the LCD displays HOLD, start sampling by pressing Start/Hold. If a time delay has been programmed, DELAYED START will flash on the LCD and the amount of time remaining until sampling starts will appear. SAMPLE RUNNING will display when the delay sequence has ended. The LCD will automatically track sampling period time elapsed.



Clip holder to worker and pump to belt.

At the end of the sampling period, press Start/Hold and record the stop time.

User Options During Sampling

Pause - Pause (shutdown) the pump by pressing Start/Hold. All timing data will freeze. To resume sampling, press Start/Hold; timing data will resume.

Flow or Battery Fault Shutdown - During restricted flow or low battery conditions, the sampler will shut down. HOLD will display on the LCD and timing functions will pause. LO BATT or FLOW FAULT will display on the LCD depending on the cause of the shutdown. To restart from flow fault, correct the blockage and press Start/Hold. If LO BATT is displayed, recharge the battery before sampling.

Display Times - Elapsed sampling period is continuously displayed on the LCD. Press and hold Pump Run Time (Figure 1, #6) to display pump run time. Press and hold Total Elapsed Time (Figure 1, #7) to display total elapsed time, including delayed start time.

continued on page 8

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Sampling with Impingers

When using impingers, place an inline trap between the pump and the impinger to protect the sampler from liquid or vapors. The impinger and trap can be mounted to the sampler using the accessory mounting screws (Figure 1, #12) or placed in a holster at the worker's waist.

- ❗ **Failure to use the impinger trap voids the warranty.**
- ❗ **Protect sample pump from weather when in use outdoors.**



Impinger holder on pump with impinger and trap

Low Flow Applications (5 to 500 ml/min) Using Single Adjustable Low Flow Holder

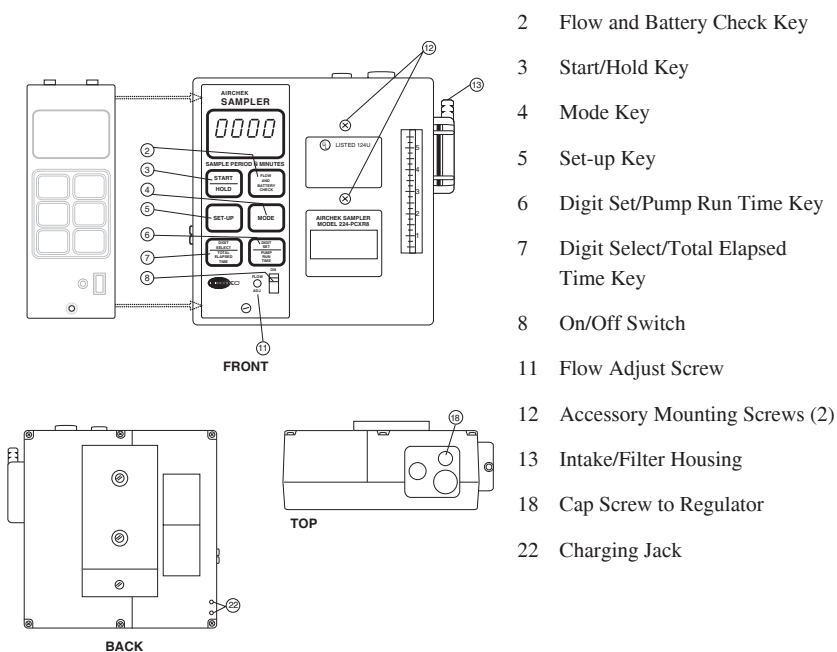


Figure 1

Front, back, and top views of PCXR8 Sampler
For additional drawings, see pp. 25 and 27.

Setup

Charge the battery by connecting the charger plug to the sampler charging jack (Figure 1, #22). Ensure that the battery is fully charged.

1



Do not charge in a hazardous environment.



Use only an SKC-approved charger designated for this model to ensure reliable performance and to maintain the SKC warranty.



Charger and battery pack connected

2

Activating the Regulator

Remove the tamper-resistant cover. Start the pump using the on/off switch (Figure 1, #8). Press Start/ Hold (Figure 1, #3). Press Flow and Battery Check (Figure 1, #2). Adjust the flow using the flow adjust screw (Figure 1, #11) until the built-in rotameter reads 1.5 L/min. The LCD should indicate BATT OK in the upper left corner (if it doesn't, recharge the battery). Press Flow and Battery Check to place the pump in Hold.

Remove the cap screw covering the regulator valve (Figure 1, #18) and turn the exposed screw four to five turns counterclockwise.

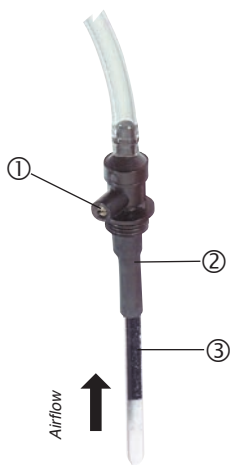
Replace the cap screw. The pump is now set for low flow.



*For low flow,
turn valve screw
counterclockwise.*

Setting or Verifying Flow Rate

For a diagram of the pump, see Figure 1, p. 9.



- 1 Flow adjustment screw
- 2 Rubber sleeve
- 3 Sorbent tube

Figure 2
Single Adjustable
Low Flow Holder
with sample tube

Connect a single adjustable low flow holder (Figure 2) to the pump intake (Figure 1, #13) using 1/4-inch Tygon tubing.

Insert an opened sorbent tube (Figure 2, #3) into the rubber sleeve (Figure 2, #2) of the low flow holder with the arrow on the tube pointing toward the holder.

Connect a flowmeter to the exposed end of the sorbent tube.



*Calibration train with tube
in low flow holder*

Loosen the screw on the low flow holder. Activate the pump by pressing Flow and Battery Check.

Adjust the flow rate by turning the brass flow adjustment screw (Figure 2, #1) on the holder until the flowmeter indicates the desired flow.



Flow
adjustment
screw

*Turn screw to
adjust flow.*



**Do not adjust the flow on the pump.
Adjust the flow only by using the
brass screw on the low flow holder.**

continued on page 12

3

3

(cont'd)

When the desired flow is set, place the pump in Hold by pressing Flow and Battery Check. Disconnect the flowmeter. Replace the sorbent tube used for setting the flow with a new unexposed sorbent tube for sample collection.

Place the appropriate size tube cover over the tube, and screw it into place on the low flow holder.

Programming Delayed and Intermittent Sampling

To enter Delayed Start Mode: From Hold, press Set-up. Enter the number of minutes delay (up to 9999) before the sampling period begins by pressing Digit Select and Digit Set. Digit Select advances the flashing digit and Digit Set increases the value of the flashing digit.

To enter Sample Period Mode: Press Mode. Press Digit Select and Digit Set to enter the sampling time period in minutes (up to 9999). **Note:** The sample period is the total period in which sampling is performed and not the pump run time.

To enter Pump Period Mode: Press Mode. This is the actual running time of the pump. Use Digit Select and Digit Set to enter the pump run time in minutes (up to 9999).



PCXR8 Keypad

If intermittent sampling is not desired, set the sampling period to equal the pump period. If the pump running time is less than the sampling period, the pump will automatically calculate and control on/off cycling to complete the pump run time during the sampling period.

Pressing Mode will scroll through the program sequence.



For intermittent sampling, the elapsed time maximum is 9999 minutes (6.8 days), at which time the sample pump will shut down.

4

Sampling

For personal sampling, clip the low flow holder to the worker in the breathing zone.

! *Protect sample pump from weather when in use outdoors.*

While the LCD displays HOLD, start sampling by pressing Start/Hold. If a time delay has been programmed, DELAYED START will flash on the LCD and the amount of time remaining until sampling starts will appear. SAMPLE RUNNING will display when the delay sequence has ended. The LCD will automatically track sampling period time elapsed.



Clip holder to worker and pump to belt.

At the end of the sampling period, press Start/Hold and record the stop time.

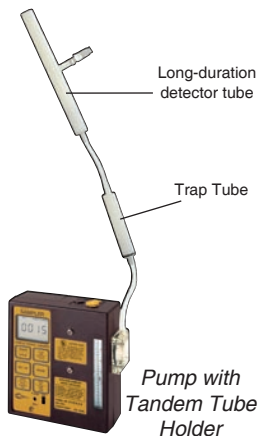
To return to high flow, remove the low flow holder and deactivate the regulator (*see p. 5*).

For user options during sampling, see p. 7.

Sampling with Long-duration Color Detector Tubes

Long-duration Color Detector Tubes require a special tube cover that accommodates an in-line trap tube. The trap tube protects the pump from caustic fumes which are often released from detector tubes. Closely read all precautions when using these tubes.

! *Failure to use the necessary traps will damage the pump and void the warranty.*



(See Optional Accessories, p. 28)

5

Low Flow Applications (5 to 500 ml/min) Using Multiple-tube Adjustable Low Flow Holder

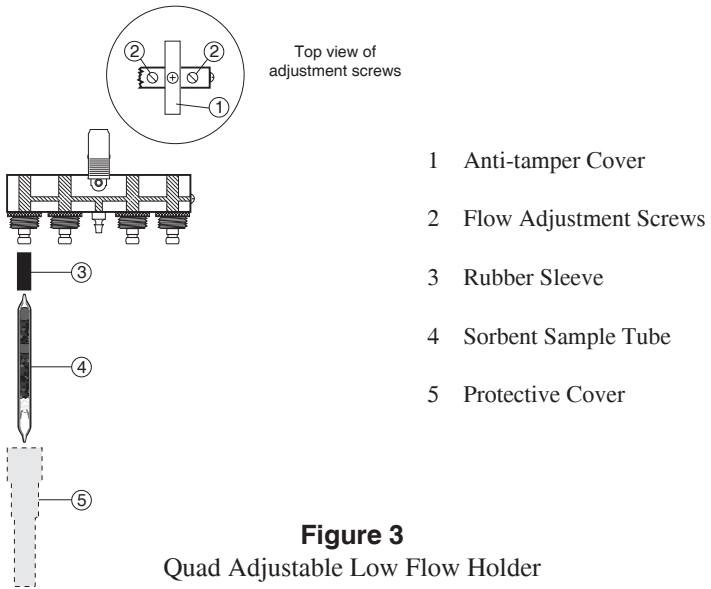


Figure 3
Quad Adjustable Low Flow Holder

Setup

For a diagram of the pump, see Figure 1, p. 9.

Charge the battery by connecting the charger plug to the sampler charging jack (Figure 1, #22). Ensure that the battery is fully charged.



Do not charge in a hazardous environment.



Use only an SKC-approved charger designated for this model to ensure reliable performance and to maintain the SKC warranty.



Charger and battery pack connected

1

Setting or Verifying Flow Rate

- !** *If performing multiple-tube sampling using an adjustable low flow holder (dual, tri, or quad), the flow rate of the pump must be greater than the sum of the flow rates through the tubes; the flow rate through any one tube cannot exceed 500 ml/min.*

Ensure the pump is set for low flow (*see Activating the Regulator, p. 10*).

Connect the adjustable low flow holder (Figure 3, p. 14) to the pump intake (Figure 1, #13) using 1/4-inch Tygon tubing.

Insert an opened sorbent tube into each rubber sleeve of the low flow holder (Figure 3, #s 3 and 4) with the arrow on the tube pointing toward the holder.

- !** *If sampling with fewer tubes than number of ports, insert unopened sorbent tubes in the empty ports to seal them.*



Connect holder to pump intake and tube inlet to flowmeter.

Note the flow rates specified by each sampling method and add them together. Set the pump to a flow rate that is greater than the sum.

Connect a flowmeter to the exposed end of a sorbent tube, loosen the screw on the low flow holder, and activate the pump by pressing Flow and Battery Check.

Turn the flow adjustment screw (Figure 3, #2) on the low flow holder until the desired flow rate is achieved. Turn clockwise to decrease the flow.

- !** *Do not adjust the flow on the pump. Adjust the flow only by using the brass screw on the low flow holder.*

continued on page 16

2

2

(cont'd)

When the desired flow is set on the initial tube, place the pump in Hold by pressing Flow and Battery Check. Remove the flowmeter from the tube and connect to the exposed end of the next sorbent tube. Press Flow and Battery Check and repeat the flow adjustment process until all tubes are flow calibrated. Changing the flow on one tube will not affect the flow rate through the remaining tubes.

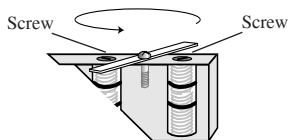


Figure 4
Cut-away of Tri/Quad Low Flow Holder

For tri and quad models, first rotate each anti-tamper cover (Figures 3 and 4) to expose the flow adjustment screw, then adjust until the flowmeter indicates the desired flow.

When the flow rate is set for each tube, press Flow and Battery Check to place the pump in Hold and disconnect the flowmeter.

Replace the sampling media used for calibration with unexposed media for sample collection. Use a protective tube cover to prevent tube breakage.

3

Programming Delayed and Intermittent Sampling

To enter Delayed Start Mode: From Hold, press Set-up. Enter the number of minutes delay (up to 9999) before the sampling period begins by pressing Digit Select and Digit Set. Digit Select advances the flashing digit and Digit Set increases the value of the flashing digit.

To enter Sample Period Mode: Press Mode. Press Digit Select and Digit Set to enter the sampling time period in minutes (up to 9999). **Note:** The sample period is the total period in which sampling is performed and not the pump run time.

To enter Pump Period Mode: Press Mode. This is the actual running time of the pump. Use Digit Select and Digit Set to enter the pump run time in minutes (up to 9999).

If intermittent sampling is not desired, set the sampling period to equal the pump period. If the pump running time is less than the sampling period, the pump will automatically calculate and control on/off cycling to complete the pump run time during the sampling period.

Pressing Mode will scroll through the program sequence.

! *For intermittent sampling, the elapsed time maximum is 9999 minutes (6.8 days), at which time the sample pump will shut down.*



PCXR8 Keypad

4

Sampling

For personal sampling, clip the low flow holder to the worker in the breathing zone.

! *Protect sample pump from weather when in use outdoors.*

While the LCD displays HOLD, start sampling by pressing Start/Hold. If a time delay has been programmed, DELAYED START will flash on the LCD and the amount of time remaining until sampling starts will appear. SAMPLE RUNNING will display when the delay sequence has ended. The LCD will automatically track sampling period time elapsed.



Clip holder to worker and pump to belt.

At the end of the sampling period, press Start/Hold and record the stop time.

To return to high flow, remove the low flow holder and de-activate the regulator (*see p. 5*).

For user options during sampling, *see p. 7*.

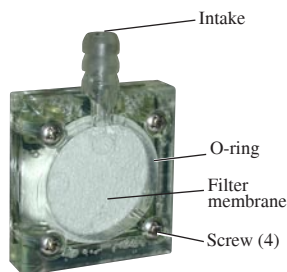
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Maintenance

Pump Inlet Filter

The PCXR8 Sampler is fitted with a filter/trap inside a clear plastic intake port housing. This prevents particles from being drawn into the pump mechanism. The filter should be visually checked to assure that it does not become clogged. If maintenance is necessary, follow this procedure:

1. Clean dust and debris from around the filter housing.
2. Remove the four screws and the front filter housing.
3. Remove and discard the filter membrane and O-ring.
4. Clean the filter housing.
5. Insert a new filter membrane and O-ring. (see *Replacement Parts*, pp. 26-27).
6. Reattach the front filter housing and cross-tighten the four screws.



Close-up of inlet filter housing

Battery Pack

For proper maintenance of battery packs, SKC offers optional chargers (see *Optional Accessories*, p. 28) that protect against memory effects. Follow charger instructions.

- ❗ **To comply with intrinsic safety regulations, battery packs should not be charged in a hazardous environment.**
- ❗ **Using a non-approved charger voids the SKC warranty.**
- ❗ **Use of a repaired or rebuilt battery pack voids the SKC warranty and the UL Intrinsic Safety Listing.**

Rotate the use of any spare packs to avoid idle periods in excess of one month. Fully charge packs before or after use or storage.

SKC UL-listed battery packs (see *Replacement Parts*, pp. 26-27) contain a protective device that eliminates potential short circuiting while the pump is in use. If the battery pack is defective, the indicator light on the battery charger will not light while charging. If you are unable to determine if your battery pack is defective, contact SKC's Customer Service Department (724-941-9701).

NiCad Battery Notes and Recommended Maintenance

- *NiCad batteries self-discharge at an average rate of 18 to 20% per month at room temperature. The rate of self-discharge increases with temperature. Ultimately, self-discharge results in an increased need for charging.*

Recommended Maintenance:

- Cycle battery use on a monthly basis (quarterly for pumps not used on a regular basis).
 - “Exercise” your battery pack! Use an SKC battery conditioning system (MasterCharger® or PowerFlex®) that automatically exercises batteries. Perform this procedure before storage and monthly (quarterly for pumps not used on a regular basis).
 - Store and charge batteries in the recommended temperature range.
 - Discharge and recharge battery packs fully before use and storage.
- *Stated battery capacity will not be reached “right out of the box,” but only after the battery is exercised. Often new NiCad battery packs require 5 to 7 cycles to reach the stated capacity.*

Recommended Maintenance:

“Exercise” your battery! Use an SKC battery conditioning system (MasterCharger or PowerFlex) that automatically exercises batteries. Perform this procedure before storage and monthly (quarterly for pumps not used on a regular basis).

- *Battery packs are typically shipped less than fully charged to meet testing and shipping requirements.*

Recommended Maintenance:

Discharge and recharge battery packs fully before use and storage.

- *A NiCad battery should not sit on a charger for long periods of time.*

Recommended Maintenance:

Remove battery pack from its charger within 24 to 48 hours after charging is complete.

For further information on Maintaining NiCad Battery Packs, request SKC Publication 1363 (available for download at www.skcinc.com).

Technical Note: Battery Pack Life

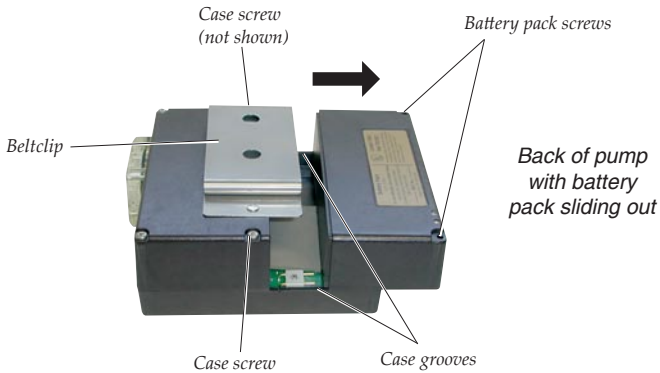
- Battery manufacturers typically indicate expected battery life as the number of usable cycles within an approximate number of years (e.g., 300 charge/discharge cycles or 3 years).
- The number of usable cycles/years of useful life for a battery pack is determined by the number of cycles/amount of time it takes for the battery to decline to 80% of its initial capacity when used under ideal conditions. The battery should be replaced at this point.
- Battery life ratings are nominal ($\pm 5\%$) and are generally based on ideal conditions of use such as those in which they are tested (*for testing criteria, see IEC 61436 and IEC 61951 test methods at www.iec.ch*).
- Individual conditions of use, charging procedures, and applications (high versus low current drain, intermittent versus steady current drain) may affect battery life.
- While nickel-metal hydride (NiMH) batteries provide longer run times than NiCad batteries on a single charge, the user can expect less cycles life from an NiMH battery when compared to NiCad cycles life.

Replacing the Battery Pack



To enhance battery life, SKC ships battery packs uncharged and separate from the pump. Once installed, completely charge battery pack before operating pump.

1. Remove the two screws that secure the battery pack and loosen the two case screws above and below the belt clip.
2. Carefully slide battery pack out from under the belt clip. Ensure that the battery is kept level.
3. Slip the front edge of the new battery pack under the belt clip and position battery pack to engage the grooves in the case.
4. Slide the battery pack toward the pump until it is flush with the pump case on all sides.
5. Reinstall battery screws and tighten the case screws.



Use of a repaired or rebuilt battery pack voids the SKC warranty and the UL Intrinsic Safety Listing.



Do not charge or operate the pump with charger in hazardous atmospheres!



Use only an SKC-approved charger and battery pack designed for the Universal Sample Pump to ensure reliable performance and intrinsic safety and to maintain the SKC warranty.

Service Policy

To return products to SKC for servicing:

1. Call 800-752-8472 (724-941-9701 for international customers) to obtain a Return Materials Authorization (RMA) number and Product Decontamination Form.
2. Carefully package the product. Mark the RMA number on any correspondence relating to the return and on the outside of the package.
3. Ship to SKC, freight prepaid, to the following address:

SKC Inc.
National Service Center
863 Valley View Road
Eighty Four, PA 15330

Package product carefully to prevent damage during transit. Include a contact name, phone number, shipping address, RMA number, and a brief description of the problem. For nonwarranty repairs, a purchase order number and billing address are also required. The Service Department will contact nonwarranty customers with an estimate before proceeding with repairs.

Note: *SKC Inc. will accept for repair any SKC product that is **not** contaminated with hazardous materials. Products determined to be contaminated will be returned unserviced.*

Parts Descriptions

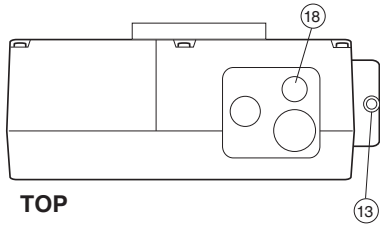
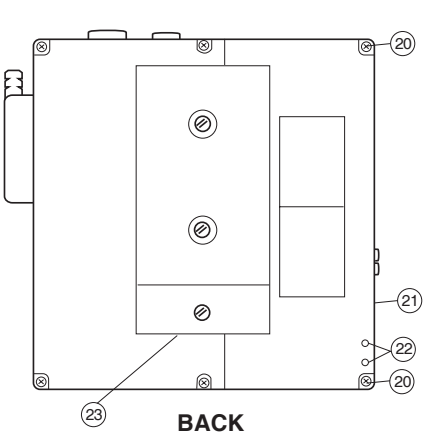
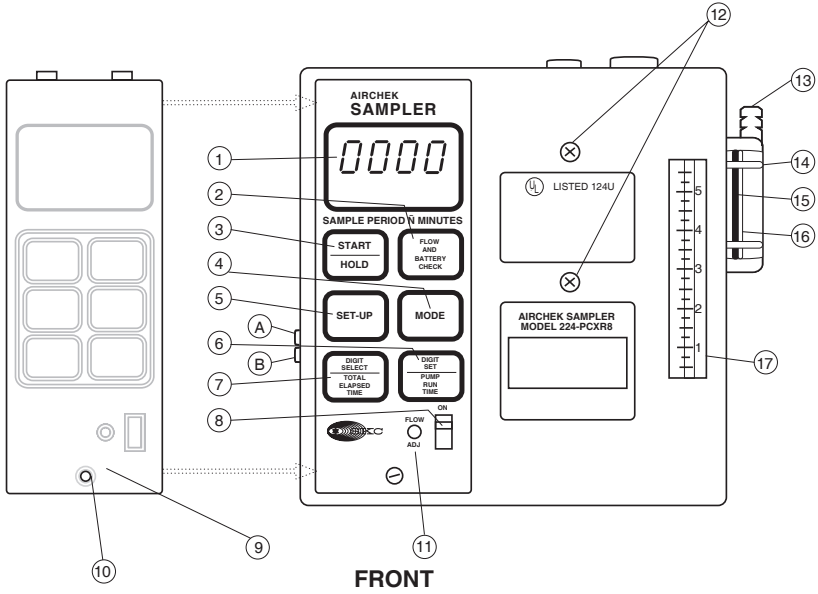
Use only SKC-approved parts to ensure reliable performance and intrinsic safety and to maintain the SKC warranty.

See page 25 for drawing.

No.	Description
1	LCD: Indicates all sampler functions.
2	FLOW AND BATTERY CHECK Key: Allows flow rate setting and battery condition testing.
3	START/HOLD Key: Used to start the sampling cycle, pause the sampling cycle, and restart the cycle after pause.
4	Mode Key: During set-up, navigates between delayed start, pump run time, and total elapsed time.
5	Set-up Key: Used to enter set-up mode to set delayed start, pump run time, and total elapsed time.
6	Digit Set/Pump Run Time Key: Sets the flashing digit to the desired value or permits viewing of actual pump run time during sampling cycle.
7	Digit Select/Total Elapsed Time Key: Selects the time digit to be set in set-up mode or permits viewing of total elapsed time during the sampling cycle.
8	ON/OFF Switch: Shuts down the pump completely and clears time display.
9	Tamper-resistant Cover: Protects controls from incidental contact or tampering.
10	Cover Screw: Fastens tamper-resistant cover.
11	Flow Adjustment Control: Adjusts flow from 1000 to 5000 ml/min.
12	Accessory Mounting Screws (2): Secure accessories such as impinger and trap holders.
13	Intake/Filter Housing: Air intake port and trap.
14	Filter Housing Screws (4): Secure filter housing.
15	Filter O-ring: Leak seal for filter in housing.
16	Filter (crimped fiber polyester): Prevents particles from entering pump.
17	Built-in Flowmeter: Monitors flow changes.
18	Cap Screw: Accesses regulator.
20	Battery Pack Screws (2): Secure pack to pump.
21	Battery Pack Assembly: Provides power to pump.
22	Charging Jack: Connector for battery charger.
23	Belt Clip: Secures pump to worker.
A	Compensation Pot A: Adjusts pump compensation which is factory set. Access screw guards against accidental contact or tampering.
B	Compensation Pot B: Adjusts pump compensation which is factory set. Access screw guards against accidental contact or tampering.

224-PCXR8 Sample Pump

See page 24 for parts listing.



Replacement Parts

See drawings on page 27.

Pump Case Parts

P21411	Case Parts (Excluding Battery Case)
P21661	Battery Pack Assembly
P22417BC	Belt Clip with screws
P22433P	Keyboard Assembly
P22433R	Cap Screws (set of 2)
P22433U	Control Board
P22433RS2	Replacement Stack (with pressure switch)

Pump Stack Parts

P22417D	Filter Housing Assembly
P22417E	Pressure Switch Assembly
P22417F	Valve Plate Assembly
P22417G	Pump Body
P22417H	Diaphragm/Yoke Assembly
P22417J	Regulator Assembly
P22417K	Pulsation Dampener Assembly (2)
P22433L	Flowmeter Assembly

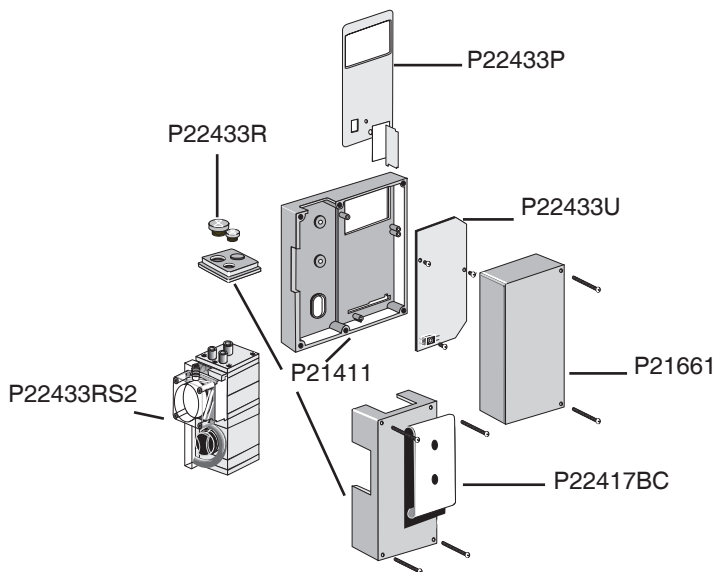
Parts not indicated in illustration

P22417M	Motor/Eccentric Assembly
P22433C	Tamper-resistant Cover
P22433ES	External Screws
P72380	Display Board
P5187	Foam cover for control board

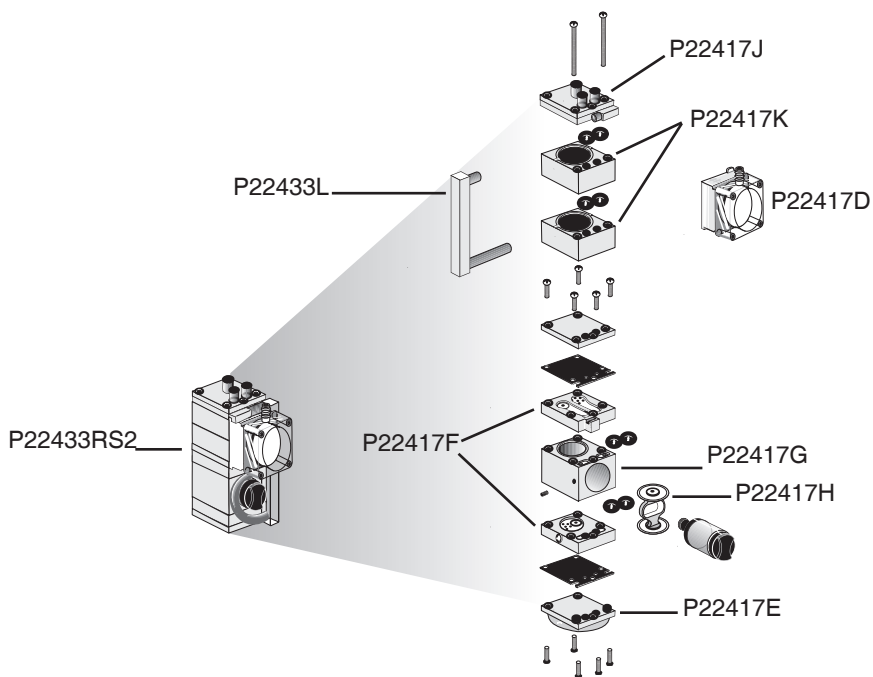
Replacement Filters

P22409	Filter/O-ring (pk/3)
P2240901	Filters (pk/10)
P2240902	Filter/O-ring (100 filters/10 O-rings)

See page 26 for replacement parts listing.



Pump Case Parts



Pump Stack (Part #P22433RS2) Exploded

Optional Accessories

Adjustable Low Flow Holders:

Single Holder	224-26-01
Dual Holder	224-26-02
Tri Holder	224-26-03
Quad Holder	224-26-04



Protective Sample Tube Covers:

Type	<i>for tubes up to:</i>	<u>Cat. No.</u>
A	70 mm long (standard charcoal)	224-29A
B	110 mm long (large charcoal)	224-29B
C	150 mm long	224-29C
D	220 mm long	224-29D
T	115 mm with tandem trap tube cover	224-29T



Battery Maintenance:

<u>Cat. No.</u>	
PowerFlex Charging System for SKC Personal Pumps	
5-station, 100 - 240 V	223-1000
Single, 120 V	223-2000
Single, 100 - 240 V	223-2000B
Replacement Battery Pack	P21661
Battery Eliminator, for sampling using line voltage	223-325

Miscellaneous:

<u>Cat. No.</u>	
Screwdriver Set (included with pump)	224-11
Protective Nylon Pouch with belt and shoulder strap, available in:	
Brown	224-95
Red	224-95A



Protective Nylon Pouch

Long-duration Detector Tube Sampling:

<u>Cat. No.</u>	
Trap Tubes	222-3D-2
Tandem Protective Tube Cover	224-29T

SKC INC.

LIMITED ONE YEAR WARRANTY

1. SKC warrants that its instruments provided for industrial hygiene, environmental, gas analysis, and safety and health applications are free from defects in workmanship and materials under normal and proper use in accordance with operating instructions provided with said instruments. The term of this warranty begins on the date the instrument is delivered to the buyer and continues for a period of one (1) year.

This warranty does not cover claims due to abuse, misuse, neglect, alteration, accident, or use in application for which the instrument was neither designed nor approved by SKC Inc. This warranty does not cover the buyer's failure to provide for normal maintenance, or improper selection or misapplication. This warranty shall further be void if changes or adjustments to the instrument are made by other than an employee of the seller, or if the operating instructions furnished at the time of installation are not complied with.

2. SKC Inc. hereby disclaims all warranties either expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose, and neither assumes nor authorizes any other person to assume for it any liability in connection with the sale of these instruments. No description of the goods being sold has been made a part of the basis of the bargain or has created or amounted to an express warranty that the goods will conform to any such description. Buyer shall not be entitled to recover from SKC Inc. any consequential damages, damages to property, damages for loss of use, loss of time, loss of profits, loss of income, or other incidental damages. Nor shall buyer be entitled to recover from SKC Inc. any consequential damages resulting from defect of the instrument including, but not limited to, any recovery under section 402A of the Restatement, Second of Torts.

3. This warranty extends only to the original purchaser of the warranted instrument during the term of the warranty. The buyer may be required to present proof of purchase in the form of a paid receipt for the instrument.

4. This warranty covers the instrument purchased and each of its component parts.

5. In the event of a defect, malfunction, or other failure of the instrument not caused by any misuse or damage to the instrument while in possession of the buyer, SKC Inc. will remedy the failure or defect without charge to the buyer. The remedy will consist of service or replacement of the instrument. SKC Inc. may elect refund of the purchase price if unable to provide replacement and repair is not commercially practicable.

6. (a) To obtain performance of any obligation under this warranty, the buyer shall return the instrument, freight prepaid, to SKC Inc., at the following address:

SKC Inc., National Service Center
863 Valley View Road
Eighty Four, PA 15330 USA

(b) To obtain return authorization information or for further information on the warranty performance you may telephone 724-941-9701 at the above address. See Service Policy section in operating manual (if applicable).

7. This warranty shall be construed under the laws of the Commonwealth of Pennsylvania which shall be deemed to be the situs of the contract for purchase of SKC Inc. instruments.

8. No other warranty is given by SKC Inc. in conjunction with this sale.

UL Certificate



Underwriters Laboratories Inc. ®

333 Pfingsten Road
Northbrook, Illinois 60062-2096
(708) 272-8800
FAX No. (708) 272-8129
MCI Mail No. 254-3343
Cable ULINC NORTHBROOK, IL
Telex No. 5502543343

CERTIFICATE No. Ex.280693-62011
28 June 1993

Issued to: SKC Inc.
R. D. 1 No. 395 Valley View Rd.
Eighty-Four, PA 15330 U. S. A.

This is to certify that: Intrinsically safe Portable Air Sampling Pumps, Models 224-43XR, 224-44XR, 224-PCXR3, 224-PCXR4, 224-PCXR7, 224-PCXR8 for use with self-contained 6.0V battery pack, Models 224-30, or P21661 and intrinsically safe portable air sampling pumps, Models 224-PC3 and 224-PC7 for use with self-contained 4.8V battery pack, Model 224-17SD have been investigated by Underwriters Laboratories Inc. in accordance with the standard indicated in this certificate.

UL Standard for Safety:

ANSI/UL 913-1988 Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1 Hazardous Locations, Fourth Edition.

The Air Sampling Pumps comply with the requirements as defined by the standard indicated in this document for intrinsically safe apparatus for use in Class I, Division 1 and 2, Groups A, B, C and D, Class II, Division 1 and 2, Groups E, F and G and Class III hazardous locations.

To establish that a product is under the Certification program it is necessary to determine that the product has been manufactured under UL's Follow-Up Service. The Listing Mark of Underwriters Laboratories Inc. on the product is the only method provided by UL to identify a product manufactured under its Follow-Up Service. The Listing Mark includes the symbol of Underwriters Laboratories Inc. " Ⓛ " together with the word "Listed" and the control number 124U.

Code: Intrinsically safe apparatus: Class I, Division 1 and 2, Groups A, B, C, D; Class II, Division 1 and 2, Groups E, F, G; and Class III,
Temperature Code T3C

Tamb= 40C

Investigation and Test
Report Reference:
E62011, 20 January 1987


Albert A. Bartkus
Associate Managing Engineer
Hazardous Locations
Engineering Services

A not-for-profit organization
dedicated to public safety and
committed to quality service